

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
ONE CONGRESS STREET
BOSTON, MASSACHUSETTS 02114**

FACT SHEET

**DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES**

NPDES PERMIT NO.: **NH0021423**

PUBLIC COMMENT PERIOD:

PUBLIC NOTICE NO.:

NAME AND ADDRESS OF APPLICANT:

**SUEZ Energy NA, Inc.
1241 Whitefield Road
Bethlehem, NH 03574**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Bethlehem Power Plant
1241 Whitefield Road
Bethlehem, NH 03574**

SIC CODE: **4911** NAICS Code(s): **221112**

RECEIVING WATER: **Ammonoosuc River (Hydrologic Basin Code: 01040001)**

CLASSIFICATION: **Class B**

CURRENT PERMIT ISSUED: **12-19-1986**
EXPIRED: **12-19-1991**
RE-APPLICATION: **7-03-1991**

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1.0 Type of Facility, Discharge Location and Proposed Action

Bethlehem Power Plant (BPP), located in Bethlehem, New Hampshire, is a 17 gross-megawatt (MW) woodchip-fired electrical generation facility (referred to hereafter as either Bethlehem Power Plant (BPP), the Station or the Facility). The Station is a “base-load” facility, having an average yearly capacity utilization rate of 98.1% for the past five years. Electricity is generated by means of one 15 MW_{net} wood- fired steam turbine unit, which began commercial operation on December 18, 1986.

Bethlehem Power Plant’s current National Pollutant Discharge Elimination System (NPDES) Permit allows the discharge of pollutants to the adjacent Ammonoosuc River. Mechanical draft cooling towers are used to recycle non-contact condenser cooling water. BPP is permitted to discharge cooling tower wastewater mixed with other process wastes and stormwater. BPP discharges stormwater through one outfall location, although the current permit (issued in 1986) indicates there are two locations.¹ Stormwater runoff is from the land adjacent to the facility, roadways, and vehicle parking areas. Although BPP has not needed to discharge any cooling/process water since it began operating in 1986², the Station requests that it continues to have the option of discharging during emergencies.

Under the Clean Water Act (CWA) §§ 301(a), 316 and 402, Bethlehem Power Plant’s pollutant discharges must receive authorization from a NPDES permit issued by the U.S. Environmental Protection Agency (EPA). EPA may not issue a permit for BPP unless the New Hampshire Department of Environmental Services (NH DES) either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violate the New Hampshire Surface Water Quality Regulations (NH-Standards) or waives its right to certify as set forth in 40 CFR §124.53. Bethlehem Power Plant has in the past obtained the necessary federal permits and state certifications. EPA last reissued the Station’s federal permit number NH0021423 on December 19, 1986. This permit expired on December 19, 1991. The permit was administratively continued, however, because the Station timely applied for permit reissuance. As a result, Bethlehem Power Plant remains subject to the existing permit until EPA issues it a new one.

EPA received Bethlehem Power Plant’s application for reissuance of the Facility’s NPDES permit on July 3, 1991. EPA currently intends to reissue the Facility’s NPDES permit. This Draft Permit proposes to continue to authorize the discharge of storm and cooling/process water.

¹ Consequently, storm water outfall 003 was removed from the Draft Permit.

² The only discharge from this facility since operations began was in 1991 to perform a benthic macroinvertebrate study. Effluent was discharged at a rate of 30 gpm for two hours.

2.0 Description of Discharge

Refer to Section 4.2 of this Fact Sheet for a description of the discharges associated with each outfall location. A schematic drawing of the flow of water at the facility and the various discharges from the facility is presented in Attachment C. A site location plan is presented in Attachment B.

3.0 Permit Limits and Conditions

The Draft Permit's proposed effluent discharge and cooling water intake limits, monitoring requirements, and implementation schedules may be found in Part I (Effluent Limitations and Monitoring Requirements) of the Draft Permit.

4.0 Basis of Permit Limits

4.1 Permit Limits, Generally

The CWA prohibits the discharge of pollutants from point sources to waters of the United States without authorization from a NPDES permit, unless the CWA specifically exempts a particular type of point source discharge from requiring a permit. The NPDES permit is the mechanism used to apply the CWA's pollution control standards and monitoring and reporting requirements directly to particular facilities. This draft NPDES permit was developed in accordance with the CWA, EPA regulations promulgated thereunder, and any other applicable federal and state legal requirements. The regulations governing the EPA NPDES permit program are generally found at 40 C.F.R. Parts 122, 124, 125, and 136.

When developing permit limits, EPA must apply both technology-based and water quality-based requirements. To the extent that both may apply, whichever is more stringent governs the permit limits. Criteria and standards for the imposition of technology-based treatment requirements in permits under Section 301(b) of the CWA, including the application of EPA-promulgated effluent limitations and case-by-case determinations of effluent limitations under Section 402(a)(1) of the CWA, are set out in 40 C.F.R. Part 125, Subpart A. Development of water quality-based permit limits is addressed in, among other provisions, CWA §§ 301(b)(1)(C) and 401, as well as 40 C.F.R. §§ 122.4, 122.44, 124.53 and 124.55.

Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 301(b) and 402 of the CWA (see 40 C.F.R. §125 Subpart A) to meet best practicable control technology currently available (BPT) for certain conventional pollutants, best conventional control technology (BCT) for conventional pollutants, and best available technology economically achievable (BAT) for toxic and non-conventional pollutants. The technology-based guidelines for industrial dischargers can be found at 40 CFR Parts 400 - 471 and represent the minimum level of control that must be imposed under section 301(b) and 402 of the CWA (See 40 CFR Part 125, Subpart A). In the absence of published technology-based effluent guidelines, the permit writer is authorized under Section 402(a)(1)(B) of the CWA to

establish appropriate technology-based effluent limitations (*e.g.*, BAT limits) on a case-by-case basis using best professional judgement (BPJ). [See also 40 C.F.R. § 125.3.] The effluent guidelines for steam electric power plants are specific for fossil fuel or nuclear fuel facilities but do not include wood fuel units. Therefore, the effluent guidelines which represent BPT and BAT as set forth in 40 CFR Part 423 are not applicable to these types of units. However, since the discharges from wood fuel units are similar to fossil fuel units, the Steam Electric Power Generating Guidelines may serve as guidance for establishing effluent limitations for those types of discharges. Therefore, limitations for wood fuel units may be based on BPT and BAT requirements established in the Federal Guidelines for the Steam Electric Power Generating Point Source Category (40 CFR Part 423) using EPA's BPJ authority.

Water-quality based limitations are required in NPDES permits when EPA and the State determine that effluent limits more stringent than technology-based limits are necessary to maintain or achieve state or federal water-quality standards. See CWA §§ 301(b)(1)(C) and 401. State Water Quality Standards provide a classification for all the water bodies in the state and specify the "designated uses" and numeric and narrative water quality criteria that water bodies in each classification should be able to achieve. The NH-Standards include a narrative statement that prohibits the discharge of any pollutant or combination of pollutants in quantities that would be toxic or injurious to human health or aquatic life. In addition, the State has adopted EPA's numerical criteria for specific toxic pollutants and toxicity criteria. State Water Quality Standards also contain antidegradation requirements to ensure that once a use is attained it will not be degraded. Permit limits must then be devised so that discharges do not cause violations of these Water Quality Standards.

The permit must limit any pollutant or pollutant parameter (conventional, non-conventional, toxic and whole effluent toxicity) that is or may be discharged at a level that causes, or has the "reasonable potential" to cause or contribute to, an excursion above any water-quality criterion. See C.F.R. § 122.44(d)(1). An excursion would occur if the projected or actual in-stream concentration exceeds the applicable criterion. In determining "reasonable potential," EPA considers: (1) existing controls on point and non-point sources of pollution; (2) pollutant concentrations and variability in the effluent and receiving water as determined from the permit application, the permittee's monthly Discharge Monitoring Reports (DMRs), and State and Federal Water Quality Reports; (3) the sensitivity of the species to toxicity testing; (4) the known water quality impacts of processes on wastewater; and, where appropriate, (5) the dilution of the effluent that would be provided by the receiving water.

In accordance with State regulations [N.H. Code of Administrative Rules, PART Env-Ws 1705.02], the flow used to calculate permit limits for facilities on rivers or streams is based on a known or estimated value of the annual seven (7) consecutive-day mean low flow at the 10-year recurrence interval (7Q10) for aquatic life and human health (non-carcinogens only) in the receiving water. Furthermore, 10 percent (%) of the receiving water's assimilative capacity is held in reserve for future needs in accordance with New Hampshire's Surface Water Quality Regulations Env-Ws 1705.01. The current set of New Hampshire Surface Water Quality Regulations were adopted on December 3, 1999, and became effective on December 10, 1999.

When using chemical-specific numeric criteria to develop permit limits, both the acute and chronic aquatic-life criteria, expressed in terms of maximum allowable in-stream pollutant concentrations, are used. Acute aquatic-life criteria are considered applicable to daily time periods (maximum daily limit) and chronic aquatic-life criteria are considered applicable to monthly time periods (average monthly limit). Chemical-specific limits are allowed under 40 C.F.R. § 122.44(d)(1) and are implemented under 40 C.F.R. § 122.45(d). In the Draft Permit for Bethlehem Power Plant, the Region has established, pursuant to 40 C.F.R. § 122.45(d)(1), maximum daily and average monthly discharge limits for specific chemical pollutants to satisfy Water Quality Standards.

Under CWA § 401, EPA may not issue a NPDES permit unless it first obtains a certification from the state confirming that all water-quality standards will be satisfied or the state waives its certification rights. If the state issues a certification with conditions, then the permit must conform to the conditions. See 40 C.F.R. §§ 124.53 and 124.55.

The Draft Permit's effluent monitoring requirements have been established under the authority of CWA §§ 308(a) and 402(a)(2) and in accordance with 40 C.F.R. §§ 122.41(j), 122.44(i) and 122.48. The monitoring program in the permit specifies routine sampling and analysis which will provide continuous, representative information on the levels of regulated materials in the waste water discharge streams. The approved analytical procedures are to be found in 40 C.F.R. Part 136 unless other procedures are explicitly required in the permit.

The CWA's anti-backsliding requirements prohibit a NPDES permit from being renewed, reissued or modified with less stringent limitations or conditions than those contained in the previous permit unless an exception to the anti-backsliding requirements applies. See CWA §§ 402(o) and 303(d)(4) and 40 C.F.R. §122.44(l)(1) and (2). EPA's anti-backsliding provisions found at 40 C.F.R. §122.44(l) generally prohibit the relaxation of permit limits, standards, and conditions. Considering that (1) the Facility has not needed to discharge process water in 20 years of operation, (2) they will only discharge during emergency situations, and (3) the sampling frequency for all parameters in the Draft Permit (outfall 001-process) has been changed to "each discharge event," the average monthly limits for outfall 001 have been removed from the Draft Permit. EPA has made this change based on new information since the last permit issuance. The last permit was issued when the plant was built and when it was believed that there would be a regular discharge of process wastewater to the river. Furthermore, the Facility has never had an emergency where a discharge was necessary. Therefore, it is unlikely that two or more emergencies would occur within one months time. The change in the Draft Permit is considered more representative of actual conditions at the plant. If two emergency discharges did somehow occur within one month, the permittee is required to sample each discharge event and meet maximum daily limits.

In addition to technology-based and water quality-based requirements, limits for thermal discharges may potentially be based on a variance from such requirements under CWA § 316(a). Section 4.3.2 includes a discussion about temperature limits. Furthermore, permit limits on

cooling water withdrawals may be imposed in a NDPEs permit under CWA § 316(b). The requirements of CWA § (b) are discussed in further detail in Section 5 of this Fact Sheet.

The permit must also satisfy the requirements of the Endangered Species Act (ESA) and the Essential Fish Habitat (EFH) provisions of the 1996 Amendments (PL 104-297) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq. (1998)). There are no endangered species located in the Ammonoosuc River and EFH requirements are discussed further in Section 7 of this Fact Sheet.

4.2 Facility Information

The Station is located on the north bank of the Ammonoosuc River in Bethlehem, New Hampshire. See Attachment B for a map showing the geographical location of the facility. As previously discussed, the plant uses wood chips as fuel to generate approximately 15 Megawatts of electric power. Heat resulting from incineration of the wood chips produces steam in the boiler. Steam is used to power a turbine electric generator which produces electric power for commercial sale. The turbine exhaust is directed to the surface condenser (non-contact) to convert the steam to water for reuse in the boiler. A two-cell mechanical draft cooling tower (180,000 gallon capacity) is used to cool and recirculate cooling water through the condenser.

Water used for domestic purposes at the facility is withdrawn from four artesian wells and discharged to a septic system. Cooling tower make-up water is taken from the Ammonoosuc River. Depending on the time of year, the Station may need up to 165,000 gallons per day. On hot days the cooling tower may evaporate an estimated 200 gallons per minute.

There are two intake structures located five feet apart, imbedded in the middle of the river and flush with the river bottom. Each intake structure consists of a small excavated area covered with a 2' by 4' Johnson (aka wedgewire) screen. The screens are made of stainless steel and have a mesh size of 0.03 inches (0.76 mm). Water flows by gravity through the screens and then through a 10 inch pipe to a below ground sump located on the bank of the river. The gravity feed rate is approximately 450 gpm depending on the height of the river. Station personnel clean the intake screens of rocks and debris twice per year or more if flow is impeded. No aquatic organisms have ever been observed on the screens. (personal communication between Sharon Zaya, EPA and Mark Driscoll, Plant Manager on July 5, 2006) The sump's capacity is 50,000 gallons. Three variable drive pumps are used to transfer sump water up to the Station. There are two 300 gpm and one 200 gpm maximum capacity pumps, although only one pump at a time is used to transfer water. Water is continually recirculated in the sump until needed.

River water is pumped up to a "drain/tempering" tank at maximum rate of 300 gpm prior to its use in the cooling tower. Other wastewater streams from the station are directed to this tank including: boiler blowdown, sandfilter backwash, demineralizer regeneration, mechanical equipment cooling, cooling tower "graver" treatment filtrate (blowdown), artesian well flushing

(2-3 hours/month), condenser cleaning³, laboratory wastewater and other miscellaneous floor drain wastes. The cooling tower is used to remove heat from the condenser non-contact cooling water in a closed-looped system. When needed because of evaporation, water is pumped from the drain/tempering tank to the towers. A schematic drawing of the flow of water at the facility and the various discharges from the facility is presented in Attachment C. Every three to five years, solids are removed from the tempering tank. Solids are removed from the cooling tower water by a side-stream softener system called “graver”. The filtrate from this system, containing tower treatment chemicals, is directed to the tempering tank (at 50 gpm) and the solids are removed for off-site disposal.

There are four underground storage tanks (each with 37,500 gallon capacity) that are also used to store cooling/process water. Usually, two of the tanks remain full in case water is needed and two tanks are kept empty for internal wastestream discharges (i.e. boiler blowdowns) when needed. These tanks are filled during an outage to perform maintenance on the cooling system.

The drain/tempering tank has three 50 gpm pumps that are used to transfer water to the cooling towers, storage tanks, or the discharge line. Therefore a maximum flow rate of 150 gpm may be discharged to the Ammonoosuc River. An eight inch pipe is used for the discharge. In case of an emergency discharge, samples would be collected from a manhole located about ten feet from the river. Historically, the only discharge to the Ammonoosuc River of cooling/process waste was in 1991 to conduct a benthic macroinvertebrate study in the receiving stream. Although BPP has never needed to discharge since the Station began operations in 1986, the company requests that it continues to have the option of discharging during emergencies.

4.3 Derivation of Effluent Limits

4.3.1 Limits for Conventional Pollutants

Limitations for conventional pollutants in the Draft Permit (pH, Oil and Grease, and Total Suspended Solids) are based upon those in the existing permit in accordance with the antibacksliding requirements found in 40 CFR §122.44.

The maximum daily flow limit of 0.72 MGD in the current permit has been reduced to 0.20 MGD in the Draft Permit to reflect the actual need of the facility should an emergency situation arise.

Limits for Total Suspended Solids (TSS) and Oil & Grease (O&G) were originally established based on Best Practicable Control Technology (BPT) requirements established in the Federal Guidelines for the Steam Electric Power Generating Point Source Category (40 CFR Part 423.12) using EPA’s BPJ authority.

³ Plugs are used to clean the condenser tubes. The solids are collected and disposed of off-site. The filtrate and rinse waters are directed to the recirculating cooling system.

The pH limits are based on New Hampshire's Surface Water Quality Regulations Env-Ws 1703.18 and New Hampshire's State statutes (N.H. RSA 485-A:8). Language has been added to the Draft Permit that allows for a change in pH limit(s) under certain conditions for process wastewater flows. A change would be considered if the applicant can demonstrate to the satisfaction of the New Hampshire Department of Environmental Services, Water Division (NHDES-WD) that the in-stream pH standard will be protected when the discharge is outside the permitted range. At that time, the applicant or NHDES-WD may request (in writing) that the permit limits be modified by EPA to incorporate the results of the demonstration.

Anticipating the situation where NHDES-WD grants a formal approval changing the pH limit(s) to outside the 6.5 to 8.0 Standard Units (S.U.), EPA added a provision to the Draft Permit allowing EPA to modify the pH limit(s) using a certified letter approach. (See Part I.A.10.b of the Draft Permit) This change would be allowed as long as it can be demonstrated that the revised pH limit range does not alter the naturally occurring receiving water pH. However, the pH limit range shall not be less restrictive than 6.0 - 9.0 S.U. as found in the National Effluent Limitation Guideline (Steam Electric Power Generating Point Source Category at 40 CFR §423.12(b)(1)).

If the State approves results from a pH demonstration study, the permit's pH limit range can be relaxed in accordance with 40 CFR 122.44(l)(2)(i)(B), based on new information not available at the time of this permit's issuance. This new information includes results from the pH demonstration study that justifies the application of a less stringent effluent limitation. EPA anticipates that the limit determined from the demonstration study, as approved by the NHDES-WD, would satisfy all effluent requirements for this discharge category and would comply with NH-Standards.

4.3.2 Limits for Nonconventional and Toxic Pollutants

Total Residual Chlorine

The limit for Total Residual Chlorine (TRC) is based on the existing permit in accordance with the antibacksliding requirements found in 40 CFR §122.44. This limit was originally established based on Best Available Technology Economically Achievable (BAT) requirements established in the Federal Guidelines for the Steam Electric Power Generating Point Source Category (40 CFR Part 423.13) using EPA's BPJ authority.

Metals

Limits for 126 priority pollutants⁴, total chromium and total zinc have been added to the Draft

⁴ The 126 priority pollutants (See 40 C.F.R. 423 Appendix A) are those potentially contained in chemicals added for cooling tower maintenance. No detectable amount is allowed in the discharge. As per the effluent guidelines and included in the Draft Permit, compliance may be determined by engineering calculations.

Permit based on Best Available Technology Economically Achievable (BAT) requirements established in the Federal Guidelines for the Steam Electric Power Generating Point Source Category (40 CFR Part 423.13(d)(1) for cooling tower blowdown) using EPA's BPJ authority.

The iron limit is based on the limit in the existing permit in accordance with the antibacksliding requirements found in 40 CFR §122.44.

The total recoverable copper limit has been updated based on new information, including a change in the NH-Standards, an update 7Q10 assessment, and a maximum daily limit of 0.2 MGD (from 0.72). A recomputation of the maximum daily copper limit to account for these changes shows a higher copper limit than the existing limit. This relaxation of the permit limit meets the anti-backsliding exemptions found at 40 C.F.R. 122.44(l)(2)(i)(B).

The maximum daily copper limit in the Draft Permit is based on the acute aquatic-life criteria, found in the current NH-Standards, multiplied by the appropriate available dilution of the receiving water. An available dilution of 93.5 for the maximum daily limit was developed for an emergency process flow event from the drain/tempering tank (Outfall 001). A maximum flow of 0.2 million gallons per day (MGD) was used, along with an estimate of the 7Q10 low flow of 32.2 cubic feet per second (cfs)⁵ (20.8 MGD) in the Ammonoosuc River just above the facility's outfall, and a 10 % set aside or reserve (Env-Ws 1705.01). See Attachment D for equation to calculate available dilution.

NH-Standards for metals such as copper are in terms of dissolved metal. However, EPA is required by 40 CFR 122.45(c) to regulate the total recoverable metals. Therefore, to convert the dissolved metal acute aquatic-life criteria to total recoverable metal, a default translator equal to the conversion factor found in Table 1703.2 of the NH-Standards was used. The default factor used assumes a receiving water hardness of 25 mg/l unless the permittee can show that different translator and hardness values are more appropriate. Accordingly, the dissolved metal standard found in Env-Ws 1703.21(b), Table 1703.1 is divided by the appropriate conversion factor (Table 1703.2) prior to deriving the appropriate total recoverable acute aquatic-life criteria. In this case, the conversion factor for acute copper is 0.96 and the acute aquatic-life criteria is 3.6 ug/l prior to the division by the conversion factor. This is consistent with the recommendations contained in Section 1.5 of the Metals Translator Guidance cited at the end of this paragraph. If there is disagreement with the above assessment, the permittee has the option of performing additional sampling of the effluent, receiving waters and effluent/receiving water mixtures in order to develop site-specific partition coefficients for these metals using the procedures described in "The Metals Translator: Guidance for Calculating A Total Recoverable Permit Limit From A Dissolved Criterion," EPA, Office of Water, EPA 823-B-96-007, June 1996." For Total Recoverable Copper, EPA calculated a maximum daily limit of 0.35 mg/l. (See Attachment D for the equation used in this calculation).

⁵ See August 9, 2005 memo from Jeff Andrews, NHDES to Janson Turgeon, EPA indicating that the 7Q10 was "[r]ecalculated in 2000 by DES by using the ratio of the drainage are[a] between the facility and the upstream gage."

The boiler, preheaters and air precipitator at BPP are physically dry cleaned. Solids are mixed with bottom ash and landfilled. Therefore, the Draft Permit includes a provision that prohibits the discharge of metal cleaning wastes.

Based on available dilution, EPA has determined that there is no reasonable potential for other metals or toxic pollutants in the discharge to cause an exceedence of NH-Standards.

Temperature

The temperature limit of 85 degrees Fahrenheit (°F) and a temperature change (ΔT) of 20 °F in the Draft Permit meets the narrative temperature criteria of the NH-Standards [Env-Ws 1703.13(b)]. Performing an energy balance on this facility's discharge using the river's temperature extremes, its 7Q10 flow likely to occur during either the summer or the winter low-flow periods, and the facility's maximum discharge temperature indicates that this facility's thermal discharge would cause an indiscernible rise in the ambient streamflow temperature. For example, assuming that during the summer and the winter low-flow periods, the in-stream ambient temperatures just above the outfall are 70 °F and 35 °F, respectively, and that the 7Q10 flow is 29 cfs (includes the reduction for the State's 10 percent reserve rule [Env-Ws 1705.01]), the 85 °F thermal discharge will only cause an increase in receiving water temperatures of 0.2 and 0.5 °F, respectively, over ambient conditions (See Attachment D for the energy balance equation). Complete mixing is assumed in this case because the river flow is rapid and turbulent in the area of the discharge. In addition, the discharge temperature is expected to be lower than the 85 °F limit because the discharge originates from the drain/tempering tank and not directly from the cooling tower. Furthermore, EPA has determined that, for this facility, the best available technology (BAT) for thermal pollution control is the use of its cooling towers. Therefore, there is no need for a 316(a) variance from this technology standard.

4.3.3 Whole Effluent Toxicity

In order to protect the Anadromous Fish Program by assuring that Bethlehem Power Plant does not discharge an effluent of toxic nature into the Ammonoosuc River, EPA-New England has included Whole Effluent Toxicity (WET) testing in the Draft Permit. EPA believes this is warranted given the discharge has reasonable potential to contain Water Treatment Chemicals (WTCs) used in the boiler water and cooling system which may be toxic to aquatic organisms if released in sufficient concentrations.

New Hampshire law states that, "all surface waters shall be free from toxic substances or chemical constituents in concentrations or combination that injure or are inimical to plants, animals, humans, or aquatic life;...." (N.H. RSA 485-A:8, VI and the N.H. Code of Administrative Rules, PART Env-WS 1703.21(a)(1)). The federal NPDES regulations at 40 CFR §122.44(d)(1)(v) require whole effluent toxicity limits in a permit when a discharge has a "reasonable potential" to cause or contribute to an excursion above the State's narrative criterion for toxicity. Where EPA - New England believes toxicity testing is appropriate and necessary as

described above, the type of toxicity testing (acute and/or chronic) and the effluent limitation (LC50 and/or C-NOEC) are set based upon available dilution as outlined in Attachment D. When WET limits are required for industrial dischargers such as this facility, EPA-New England adopts those limits from the Toxicity Strategy for Municipal Permits (Attachment E).

Based upon available dilution and in accordance with EPA-New England's Toxicity Policy, an acute limit of LC50 using a sample of 100 percent effluent is added to the Draft Permit. LC50 is defined as the concentration of toxicant, or in this case, as percentage of effluent that would be lethal to 50 % of the test organisms during a specific time period. The Acute-No Observed Effect Concentration (A-NOEC) monitoring-only requirement is included in the Draft Permit due to the potential presences of WTCs in the discharge.

Results of these toxicity tests will demonstrate compliance with the no toxic provision of the NH-Standards. The Draft Permit includes the WET testing requirement for each discharge event. The acute WET test calls for 48 hour testing using the species Daphnid (Ceriodaphnia dubia) and Fathead Minnow (Pimephales promelas). Results from these tests will provide the EPA, the State and the permittee with an estimate of the overall toxic content of its discharge. If toxicity violations are shown, monitoring frequency and testing requirements may be increased in addition to enforcement actions. The permit may also be modified, or alternatively, revoked and reissued to incorporate additional toxicity testing requirements or chemical specific limit(s).

This Draft Permit requires reporting of selected parameters determined from the chemical analysis of the WET tests 100 % effluent sample. Specifically, Ammonia Nitrogen as Nitrogen, Hardness, and Total Recoverable Cadmium, Copper, Chromium, Lead, Nickel and Zinc are to be reported on the appropriate Discharge Monitoring Report (DMR) for entry into EPA's Permit Compliance System's Data Base. EPA-New England does not consider these reporting requirements an unnecessary burden as reporting these constituents is required with the submission of each toxicity testing report. (See Draft Permit, Attachment A, page A-8.)

4.3.4 Water Treatment Chemicals (WTCs)

This facility operates its cooling tower and steam condenser system as a continuous recycle, closed-loop system resulting in no discharge to the receiving water. However, cooling tower blowdown, boiler blowdown, and other process wastewater may be discharged from Bethlehem Power Plant through Outfall 001(drain/tempering tank) during an emergency. Given the nature of the possibly sudden and infrequent discharge, EPA-New England is concerned about the potential build-up of toxic substances in the drain/tempering tank. Water treatment chemicals are added to both the cooling water and the boiler water, therefore the blowdown wastewater contains these chemicals. Thus, monitoring water in the drain/tempering tank would lend insight into whether or not there is potential for the discharge of toxic substances in the process waste through Outfall 001.

Consequently, EPA has required that every July, the permittee must collect a representative sample of water from the drain/tempering tank and perform, on that sample, a: 48-Hour static acute WET test using two species, Daphnid (Ceriodaphnia dubia) and the Fathead Minnow

(Pimephales promelas) as previously described.

EPA-New England believes this approach is necessary to monitor for the potential build up, if any, of toxic substances in the drain/tempering tank due to the facility's method of operation and in order to prevent future exceedances in permitted limits and/or in-stream NH-Standards should the tempering tank need to be suddenly drained. Furthermore, when an emergency discharge situation occurs, there will be little or no opportunity to evaluate this effluent's ability to meet permitted limits and/or in stream NH-Standards. Therefore, EPA-New England decided to take the proactive stance outlined above to be prepared for the onset of an "emergency discharge" situation if and when it occurs. Results of these analyses are considered "New Information" and could result in additional limits and/or monitoring requirements for Outfall 001 (process wastewater).

Should BPP discharge the contents of the drain/tempering tank, the flow rate shall not exceed 150 gpm as required by the Draft Permit. At this flow rate, the effluent adds a one percent increase over the 7Q10 flow levels after accounting for the State's 10 percent reserve rule. At 150 gpm discharge rate, it will take approximately 24 hours to completely empty the tank of its 140,000 gallon contents. Monitoring for all parameters including performing a WET test is required during any discharge.

4.3.5 Storm Water

Effluent Limitations

Since EPA has not promulgated any guidelines for storm water discharge from wood burning power plants, EPA is using the following approach in this Draft Permit: (1) continue the existing permit's storm water limit for Oil & Grease in the Draft Permit in accordance with the antibacksliding requirements found in 40 CFR §122.44; (2) adding monitoring with a maximum discharge limit for iron based on the 2006 Draft Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities⁶ (MSGP); (3) continue TSS monitoring but adding a maximum discharge limit based on the 2006 Draft MSGP; and (4) require the permittee to annually update its Storm Water Pollution Prevention Plan (SWPPP) for its storm water discharges.

A provision has been added to the Draft Permit, similar to that required by the 2006 Draft MSGP, which allows for a reduction in monitoring if four consecutive monitoring values show compliance with the permit limits.

Storm Water Pollution Prevention Plan

⁶ Federal Register, Vol. 70, No. 230, December, 1, 2005, p. 72116 - 72120.

Pursuant to Section 304(e) of the CWA and 40 C.F.R. §125.103(b), Best Management Practices (BMP) may be expressly incorporated into a permit on a case-by-case basis where necessary to carry out Section 402(a)(1) of the CWA. This facility engages in activities which could result in the discharge of toxic and hazardous pollutants to waters of the United States either directly or indirectly through storm water runoff. These operations include at least one of the following from which there is or could be site runoff: material storage, in-facility transfer, material processing, material handling, or loading and unloading. The permit requires this facility to update its SWPPP which includes Best Management Practices appropriate for this specific facility to control storm water discharges from these and other activities which could contribute pollutants to waters of the United States, potentially violating the State's Water Quality Standards. Specifically, at this facility, waste ash and wood chip storage areas are examples of material storage, processing and handling operations that shall continue to be included in the SWPPP.

The goal of the SWPPP is to eliminate or reduce the potential for the discharge of pollutants through the storm water system. In the event the potential cannot be eliminated, the permittee should select BMPs to reduce, to the maximum extent possible, the pollutant loading to the receiving water. The SWPPP requirements direct the permittee to review the physical equipment, the operational procedures, and the operator training at the facility. The objective of this review is to protect waters of the United States by eliminating or minimizing the potential discharge of any pollutants.

The SWPPP requirements in the Draft Permit are intended to facilitate a process whereby the permittee thoroughly evaluates potential pollution sources at the power plant, and following that, selects and implements appropriate measures necessary to prevent or control the discharge of those potential pollutants in storm water runoff.

This process involves the following four main steps: (1) forming a team of qualified facility personnel who will be responsible for updating the SWPPP and assisting the plant manager in its implementation; (2) reassessing the potential storm water pollution sources; (3) selecting and implementing appropriate management practices and controls for these potential pollution sources; and (4) reevaluating, periodically, the effectiveness of the SWPPP in preventing storm water contamination and in complying with the various terms and conditions of the Draft Permit.

The Draft Permit requires the permittee to update and submit the SWPPP no later than 60 days after the permit's effective date and continue to implement the plan throughout the duration of the permit. The SWPPP is a supporting element to any numerical effluent limitation by minimizing the discharge of pollutants through proper operation of the facility. Consequently, the SWPPP is as equally enforceable as the numerical limits on the storm water discharges. EPA has developed a Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activities, which includes the Timber Products (Sector A) and Steam Electric Power Generating (Sector O) categories, that while not directly applicable to this facility, have components in their individual SWPPP that are potentially applicable to this facility. For example, in the Steam Electric category, runoff from coal piles is akin to runoff from waste ash

piles; while, in the Timber Products category, runoff from log storage and handling areas is akin to runoff from wood chip storage areas. Therefore, the permittee is encouraged to review both SWPPP plans which can be found in the Federal Register, Vol. 70., No. 230, December 1, 2005, p. 72116 - 72120.

5.0 Cooling Water Intake Structure -CWA § 316(b)

With any NPDES permit issuance or reissuance, EPA is required to evaluate or re-evaluate compliance with applicable standards, including those stated in Clean Water Act (CWA) Section CWA §316(b) regarding cooling water intake structures. CWA §316(b) applies if the permit applicant seeks to withdraw cooling water from a water of the United States. To satisfy §316(b) the permit applicant must demonstrate to the satisfaction of the EPA (or, if appropriate, the State) that the location, design, construction, and capacity of the facility's cooling water intake structure(s) (CWIS) reflect the Best Technology Available (BTA) for minimizing adverse environmental impacts. Such impacts include death or injury to aquatic organisms by impingement (being pinned against screens or other parts of a cooling water intake structure) or entrainment (being drawn into cooling water systems and subjected to thermal, physical or chemical stresses).

EPA has promulgated final §316(b) regulations providing specific technology standard requirements for the following:

1. new power plants and other types of new facilities with CWISs (so-called "Phase I" facilities). 66 Fed. Reg. 65255 (Dec. 18, 2001) (effective date of the regulations is January 17, 2002);
2. existing power plants with flows of 50 million gallons per day or more ("Phase II" facilities). 69 Fed. Reg. 41576 (July 9, 2004) (effective date is September 7, 2004); and
3. new offshore oil and gas extraction facilities that have a design intake flow threshold of greater than 2 million gallons per day ("Phase III" facilities). 71 Fed. Reg. 35006 (June 16, 2006) (effective date is July 17, 2006).

These regulations do not, however, apply to existing *small* power plants such as Bethlehem Power Plant (or to existing manufacturing facilities). Instead, EPA continues to rely upon the existing NPDES program, which implements section 316(b) for these facilities on a case-by-case, best professional judgment basis. See 40 C.F.R. § 125.90(b). EPA has determined that BPP's CWIS presently employs the best technology available for minimizing adverse environmental impact for the reasons presented below.

"Location"

Bethlehem Power Plant's CWIS is imbedded in the stream bed, flush with the bottom, in the middle of the Ammonoosuc River. The river water flow rate at this location is rapid at all times. For this reason, it is unlikely that fish or any other aquatic organisms would be impinged. Mark Driscoll, Plant Manager of BPP indicated that no aquatic organisms have ever been observed on the screens (personal communication with Sharon Zaya, EPA and on July 5, 2006).

Furthermore, the segment of the river in Bethlehem, NH, where the facility is located, is not a

preferred location for spawning of salmon or other indigenous species. As a transient area only, there is little potential for entrainment of eggs and larvae.

“Design and Construction”

Bethlehem Power Plant’s CWIS consists of two embedded chambers in the stream bed, covered with 2' by 4', 0.76 mm mesh wedgewire screens. This size mesh reduces entrainment of larvae and certain eggs. Water flows by gravity through the screens and then through a 10 inch pipe to a 50,000 gallon below ground sump, located on the bank of the river. The low intake velocity further reduces any potential for impingement.

“Capacity”

Bethlehem Power utilizes two mechanical draft cooling towers for cooling condenser water. This recirculating system significantly reduces the amount of river water withdrawn compared to a once-through system.

6.0 Antidegradation

The Draft Permit is being reissued with added sampling parameters and more stringent monitoring frequency’s, limits and requirements. Therefore, EPA expects the State of New Hampshire to indicate that there will be no lowering of water quality and no loss of existing water uses and that no additional antidegradation review is warranted.

7.0 Essential Fish Habitat

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.(1998)), EPA is required to consult with the National Marine Fishery Service (NMFS) if EPA’s action or proposed actions that it funds, permits, or undertakes, “may adversely impact any essential fish habitat.” 16 U.S.C. § 1855(b). The Amendments broadly define “essential fish habitat” (EFH) as: “waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. 16 U.S.C. § 1802(10). Adversely impact means any impact which reduces the quality and/or quantity of EFH. 50 C.F.R. § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Id.

Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C. § 1855(b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

The Connecticut River and its tributaries, including the Ammonoosuc River in the vicinity of Bethlehem, are designated essential fish habitat (EFH) for Atlantic salmon (*Salmo salar*). According to the New Hampshire Fish and Game Department, there is an extensive stocking program in the upper Ammonoosuc River. The reach of the Ammonoosuc River where the intake and discharge is located is a fish transient area, used by smolts during their spring

migration to the sea via the Connecticut River.

EPA has concluded that the plant operating conditions and the limits and conditions contained in this draft permit minimize adverse effects to Atlantic salmon EFH for the following reasons:

- 1- the Facility has been operating closed-loop, with no discharge for 20 years;
- 2- the only permitted process waste discharge is during an emergency;
- 3- EPA and NHDES must be notified of a discharge and extensive monitoring is required;
- 4- cooling towers are used to cool condenser cooling water;
- 5- if there were a discharge, the effluent would be rapidly diluted so as to raise the ambient temperature by no more than 0.5 degrees Fahrenheit;
- 6- yearly WET testing is required for the drain/tempering tank contents to evaluate this effluent's ability to meet permitted limits and/or in stream NH-Standards; and
- 7- the location, design, construction, and capacity of the facility's cooling water intake structure(s) (CWIS) reflect the Best Technology Available (BTA) for minimizing adverse environmental impacts.

EPA believes the Draft Permit adequately protects Atlantic salmon EFH, and therefore additional mitigation is not warranted. If adverse impacts to EFH do occur as a result of this permit action, or if new information becomes available that changes the basis for this determination, then NMFS will be notified and consultation will be promptly initiated.

8.0 Monitoring Frequency

Considering both that the Facility has not needed to discharge process water in 20 years of operation and that they will only discharge during an emergency situation, the sampling frequency for all parameters in the Draft Permit (outfall 001) has been changed to "each discharge event".

Storm water monitoring frequency has been changed from monthly to quarterly based on EPA's Storm Water Multi-Sector General Permit for Industrial Activities (70 Fed. Reg. 72116) using EPA's BPJ authority.

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308(a) of the CWA as required by 40 C.F.R. 122.41 (j), 122.41 (j)(4), (5), 122.44 and 122.48.

9.0 State Certification Requirements

EPA may not issue a permit unless the State Water Pollution Control Agency with jurisdiction over the receiving water(s) either certifies that the effluent limitations and/or conditions contained in the permit are stringent enough to assure, among other things, that the discharge will not cause the receiving water to violate the State's Surface Water Quality Regulations (NH-Standards) or waives its right to certify as set forth in 40 CFR §124.53.

Upon public noticing of the Draft Permit, EPA is formally requesting that the State's certifying

authority make a written determination concerning certification. The State will be deemed to have waived its right to certify unless certification is received within 60 days of receipt of this request.

The NHDES-WD is the certifying authority. EPA expects that the Draft Permit will be certified. Regulations governing state certification are set forth in 40 CFR §§124.53 and 124.55.

The State's certification should include the specific conditions necessary to assure compliance with applicable provisions of the CWA, Sections 208(e), 301, 302, 303, 306 and 307 and with appropriate requirements of State law. In addition, the State should provide a statement of the extent to which each condition of the Draft Permit can be made less stringent without violating the requirements of State law. Since certification is provided prior to permit issuance, failure to provide this statement for any condition waives the right to certify or object to any less stringent condition which may be established by EPA during the permit issuance process following public noticing as a result of information received during that noticing. If the State believes that any conditions more stringent than those contained in the Draft Permit are necessary to meet the requirements of either the CWA or State law, the State should include such conditions and, in each case, cite the CWA or State law reference upon which that condition is based. Failure to provide such a citation waives the right to certify as to that condition. The sludge conditions implementing section 405(d) of the CWA are not subject to the 401 certification requirements. Reviews and appeals of limitations and conditions attributable to State certification shall be made through the applicable procedures of the State and may not be made through the applicable procedures of 40 CFR Part 124.

10.0 General Conditions and Definitions

The remaining general and special conditions of the permit are based on the NPDES regulations, 40 C.F.R. Parts 122 through 125, and consist primarily of management requirements common to all permits.

11.0 Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to Sharon Zaya, U.S. EPA, Office of Ecosystem Protection, Industrial Permits Branch (CIP), 1 Congress Street, Suite 1100, Boston, Massachusetts 02114-2023. Any person, prior to such date, may submit a request in writing for a public hearing to consider the Draft Permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public meeting may be held if the criteria stated in 40 C.F.R. § 124.12 are satisfied. In reaching a final decision on the Draft Permit, the EPA will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after any public hearings, if such hearings are held, the EPA will issue a Final Permit decision and forward a copy of the final decision to the

applicant and each person who has submitted written comments or requested notice. Within 30 days following the notice of the Final Permit decision, any interested person may submit a petition for review of the permit to EPA's Environmental Appeals Board consistent with 40 C.F.R. § 124.19.

12.0 EPA Contact

Additional information concerning the Draft Permit may be obtained between the hours of 9:00 A.M. and 5:00 P.M., Monday through Friday, excluding holidays from:

**Ms. Sharon Zaya, Environmental Engineer
U.S. Environmental Protection Agency
Office of Ecosystem Protection
1 Congress Street, Suite 1100 (CIP)
Boston, Massachusetts 02114-2023
Telephone: (617) 918-1995 / FAX No.: (617) 918-0995**

August 4, 2006

Date:

**Linda M. Murphy, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency**